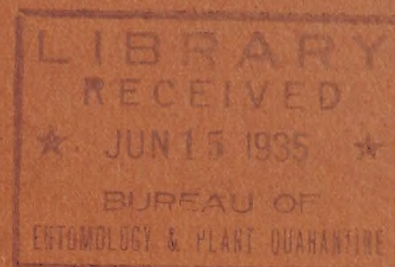


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UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Entomology and Plant Quarantine
Division of Insecticide Investigations



A REVIEW OF NON-CHEMICAL UNITED STATES PATENTS
ISSUED FROM 1917 to 1933, INCLUSIVE,
RELATING TO INSECT CONTROL

By

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Washington, D. C.

A Review of Non-Chemical United States Patents
Issued from 1917 to 1933 inclusive, relating
to Insect Control.

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During the seventeen-year period 1917 - 1933 inclusive the United States Patent Office issued 737,560 patents, including 4800 reissues. Of these 3,450 relate to devices for electrocuting, trapping, incinerating, crushing or otherwise destroying noxious insects; to apparatus for applying fumigants, sprays or dusts to insects; to machinery for washing residues of arsenic and lead from sprayed apples; and to window screens, cedar chests, tree collars and other mechanical barriers against insects.

Beginning in July 1934 and ending in April 1935 the Division of Insecticide Investigations of the Bureau of Entomology and Plant Quarantine issued 47 mimeographed lists of these patents classified, in general, according to the system of the United States Patent Office. It is believed that economic entomologists, manufacturers of spraying and dusting equipment and all others interested in combating insects will profit from a study of the patents referred to in these lists.

The titles of these lists and the number of patents in each list are shown in Table I.

Table I.

Titles of patent lists issued by the Division of Insecticide Investigations and the number of patents abstracted in each list.

Patent List No.	Title	Nos. of Patents Abstracted
1.	Insect Electrocutors	56
2.	Insect Traps Using Artificial Light	52
3.	Suction Machines for Catching Insects	20
4.	Mechanically Operated Insect Traps	28
5.	Reticulate Fabric Insect Traps	63
6.	Fly Vases	36
7.	Garbage Can Insect Traps	15
8.	Traps for Crawling Insects	60
9.	Insect Barriers for Use on Furniture	27
10.	Insect Barriers for Use on Tree Trunks	15
11.	Window and Door Screen Fly Traps	47
12.	Machines for Removing Insects from Plants	46
13.	Fly Exits for Screens	52
14.	Devices for Catching Insects with Adhesives	53
15.	Compressible Insect Powder Dusters	26

Table I. (Cont'd)

Patent List No.	Title	Nos. of Patents Abstracted
16.	Fly Swatters	86
17.	Screen Door Shoo-Fly Attachments	20
18.	Boll Weevil Machines	115
19.	Anti-Vermin Poultry Roosts	84
20.	Fumigating Devices	136
21.	Apparatus for Applying Insecticidal Dusts	156
22.	Poison Bait Holders	40
23.	Fly Nets and Bed Canopies	44
24.	Apparatus for Destroying Insects by Heat	18
25.	Apparatus for Combating Insects on Animals	177
26.	Spring Operated Insect Killers	22
27.	Implements for Catching Insects	16
28.	Traveling Suction Machines	23
29.	Miscellaneous Devices for Combating Insects	55
30.	Nozzles for Insecticide Sprayers	49
31.	Hand Pump Atomizer Type Sprayers	38
32.	Nozzle Devices for Dissolving and Mixing Insecticides	36
33.	Insecticide Sprayers, Part I	102
34.	Insecticide Sprayers, Part II	83
35.	Driers for Washed Fruit	19
36.	Apparatus for Washing Insecticide Residues from Fruits and Vegetables. Part I. Tank Washers.	32
37.	Apparatus for Washing Insecticide Residues from Fruits and Vegetables. Part II. Scrubbers and Assorters.	67
38.	Apparatus for Washing Insecticide Residues from Fruits and Vegetables. Part III. Conveying Washers.	70
39.	Apparatus for Washing Insecticide Residues from Fruits and Vegetables. Part IV. Conveying Brush Washers.	66
40.	Apparatus for Washing Insecticide Residues from Fruits and Vegetables. Part V. Miscellaneous Devices.	54
41.	Screens for Windows and Doors, Part I.	388
42.	Screens for Windows and Doors, Part II.	282
43.	Rolling Window Screens	245
44.	Window Screens, Extensible	146
45.	Apparatus for Destroying Smut on Grain	77
46.	Mothproof Garment Bags and Chests and Other Devices for Combating Clothes Moths	148
47.	Screens for Protecting Man, Plants, and Foods from Insects	41

The number of patents issued during each of the years 1917 to 1933 inclusive which are abstracted in each of the 47 lists is shown in Table II.

Table II.
Number of Patents Abstracted in Each List for Each Year, 1917-1933,
Inclusive.

Patent List No.	YEARS																	Total
	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	
1	2	0	3	2	2	4	3	4	4	2	4	3	3	3	2	10	5	56
2	2	4	4	0	4	1	2	8	5	1	1	6	4	4	6	0	0	52
3	1	1	4	1	1	0	1	3	1	2	0	0	0	0	4	1	0	20
4	4	4	2	1	5	0	7	1	1	1	1	0	1	0	0	0	0	28
5	6	7	8	7	2	3	8	5	6	4	0	0	2	2	2	1	0	63
6	2	6	3	5	5	0	1	1	3	1	0	3	3	2	0	0	1	36
7	4	1	3	1	0	0	2	1	0	2	0	0	0	0	1	0	0	15
8	3	2	2	2	5	1	3	6	4	5	4	2	6	3	7	2	3	60
9	5	1	1	0	1	1	4	4	2	2	1	1	0	1	1	1	1	27
10	0	1	3	1	0	1	0	1	1	1	0	1	1	0	2	2	0	15
11	7	7	3	7	2	3	5	1	2	2	1	0	1	1	3	2	0	47
12	6	5	1	2	4	3	2	6	5	3	1	2	5	1	0	0	0	46
13	4	8	3	7	2	1	3	2	4	4	2	0	3	6	2	0	1	52
14	6	4	3	0	3	3	7	6	5	3	5	3	1	0	2	2	0	53
15	0	3	1	0	8	1	2	5	0	0	0	1	1	0	0	0	4	26
16	8	10	6	7	6	2	5	8	2	7	4	8	1	2	2	5	3	86
17	4	1	1	1	1	1	4	0	1	0	1	4	1	0	0	0	0	20
18	13	15	5	8	4	6	20	22	9	3	4	3	1	1	1	0	0	115
19	10	6	3	8	2	2	2	7	11	2	13	3	1	3	0	2	2	84
20	6	2	8	3	7	4	3	7	5	7	14	9	13	9	14	17	8	136
21	6	6	6	5	10	11	19	9	20	8	8	8	6	7	7	15	5	156
22	3	3	2	1	1	1	1	2	1	4	1	2	3	3	5	4	3	40
23	4	4	1	3	4	2	2	2	3	2	1	3	3	2	4	2	2	44
24	1	1	0	1	0	4	1	2	3	2	0	0	0	1	0	1	1	18
25	26	19	28	9	9	6	8	17	17	11	7	2	8	4	6	6	1	184
26	1	1	5	4	0	1	2	3	1	1	1	1	0	0	0	1	0	22
27	1	2	0	1	0	0	1	1	0	0	4	0	3	2	1	0	0	16
28	8	3	2	0	1	3	5	1	0	0	0	0	0	0	0	0	0	23
29	7	2	2	1	4	2	5	3	0	3	1	1	4	6	2	9	3	55
30	6	4	1	7	1	0	4	3	2	3	4	1	5	4	1	2	1	49
31	0	1	1	0	2	0	0	1	1	0	5	2	10	1	8	3	3	38
32	3	1	3	1	2	3	3	0	0	0	0	2	1	4	6	4	3	36
33	1	6	2	2	6	1	4	18	19	8	8	7	3	6	3	2	6	102
34	0	0	1	2	3	3	8	5	11	5	10	3	3	8	3	7	11	83
35	1	3	2	2	0	0	1	0	1	1	0	4	1	0	0	2	1	19
36	5	4	1	2	3	0	1	3	0	1	2	2	2	2	2	2	0	32
37	0	4	4	4	3	7	6	5	3	2	2	8	3	5	2	3	6	67
38	3	2	4	1	4	4	7	2	1	1	2	7	11	6	5	4	6	70
39	1	0	2	2	1	1	5	1	4	2	5	10	12	3	6	10	1	66
40	2	1	4	1	1	5	4	4	2	0	3	3	4	5	1	3	11	54
41	33	26	13	11	9	10	18	19	15	19	16	22	53	49	39	17	19	388
42	16	18	12	15	9	9	12	11	17	29	15	21	24	20	23	18	13	282
43	28	24	14	12	8	5	6	5	13	8	4	17	15	21	24	31	10	245
44	25	5	5	7	3	4	11	4	4	11	4	5	12	16	11	9	10	146
45	8	7	6	3	7	2	2	3	2	4	9	5	5	3	3	1	7	77
46	7	2	4	4	1	2	9	12	5	13	9	11	8	18	13	16	14	148
47	3	2	2	3	1	3	0	1	2	3	3	1	5	4	3	1	4	41
Total	292	239	194	167	157	126	236	235	218	193	180	197	253	238	227	218	168	3538
Less Dup- licates	5	7	2	4	2	2	4	5	3	11	4	6	8	8	7	8	2	88
Net Total	287	232	192	163	155	124	232	230	215	182	176	191	245	230	220	210	166	3450

The proportion of these pest control device patents to the total number issued each year by the United States Patent Office is shown in Table III:

TABLE III.

Total number of patents issued by the United States Patent Office for each year, 1917-1933 inclusive, and proportion of pest control device patents.

Year	Total Patents	Pest Control Device Patents	Percent of Total
1917	41248	287	0.696
1918	38734	232	0.598
1919	37075	192	0.518
1920	37397	163	0.436
1921	38124	155	0.407
1922	40470	124	0.306
1923	38860	232	0.598
1924	42829	230	0.538
1925	46716	215	0.460
1926	45025	182	0.405
1927	42057	176	0.419
1928	42711	191	0.448
1929	45658	245	0.537
1930	45610	230	0.505
1931	52061	220	0.423
1932	53888	210	0.396
1933	49097	166	0.339
Total	737560	3450	Av. 0.467

A study of the data in these tables leads to the following conclusions:

1. Less than one-half of one percent of the country's inventive energy is being turned to the problem of insect control by mechanical means.

2. In view of the enormous losses caused annually by insects (two billion dollars) and by fungi (one billion dollars) in the United States, greater effort by our inventors should be made to find improved means of controlling these pests. However, activity in this field should be guided by a better knowledge of the life histories and habits of the insects to be controlled. For example the development of a complicated light trap for catching cotton boll weevils is a waste of time because this insect is not positively phototropic and is not attracted to such a trap. It also seems that work devoted to devising new forms of fly swatters and window screens could more profitably be directed to other lines. Many improvements are possible in spraying, dusting and fumigating apparatus and the possibilities of applying sound waves, radio waves, light waves, and heat waves either to destroy insects or to lure them into traps have not been adequately explored. Inventors are urged to pay more attention to the problem of pest control and to work in cooperation with entomologists and insecticide chemists in order that their efforts may not be misdirected.

The Division of Insecticide Investigations of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C., will be glad to send any of the 47 lists of patents mentioned above to entomologists, manufacturers and others who may be interested.

